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Building & Highway Material Testing Laboratory

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Job No.: CTCE/BBMP/W.No.12/KRIDL/QB(BC)/2013-14 19.08.2013

TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

CLIENT	:	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
AGENCY	:	**Technical Manager (West),** KRIDL, Bangalore.
NAME OF THE WORK	:	Asphalting from Pipeline road junction to Abbigere village Abbigere main road in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
REFERENCE	:	EE/DD/WO/122/2011-12 Dated: 10.02.2012
SOURCE OF LOCATION	:	Hot mix Plant, Bangalore
DATE OF TESTING	:	19.08.2013

The results of the tests conducted on the bitumen sample.

Sl. No	Description	Test Method as per IS	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 ^{0}C, 1/10 mm	IS :1203 -1978 (RA-2009)	66	60 to 70
2	Softening point, ^{0}C	IS :1205 -1978 (RA-2009)	47	Min. 45
3	Ductility at 27^{0}C, cm	IS :1208 -1978 (RA-2009)	100 >	Min. 50
4	Flash Point, ^{0}C	IS :1209 -1978 (RA-2009)	302	Min. 220

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Job No.: CTCE/BBMP/W.No.12/KRIDL/BC/AIV/2013-14 19.08.2013

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of the Work	Asphalting from Pipeline road junction to Abbigere village Abbigere main road in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
Reference	EE/DD/WO/122/2011-12 Dated: 10.02.2012
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	19.08.2013

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	386	388	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	85	86	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	301	302	
4	Aggregate Impact value = percent fines 100* (W_2/W_1) percent	22.02	22.16	**22.09**

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%

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Job No.: CTCE/BBMP/W.No.12/KRIDL/BC/Shape.T/2013-14 : 19.08.2013

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	: **Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	: **Technical Manager (West),** KRIDL, Bangalore.
Name of Work	: Asphalting from Pipeline road junction to Abbigere village Abbigere main road in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
Reference	: EE/DD/WO/122/2011-12 Dated: 10.02.2012
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Bituminous Concrete
Date of Testing	: 19.08.2013

Result : Flakiness Index = **11.02%**

Elongation Index = **13.65%**

Result : Combined Flakiness & Elongation index **24.67%**

Comments:

→ Maximum allowable Flakiness & Elongation Index for Bituminous Concrete is 30%

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Job No.: CTCE/BBMP/W.No.12/KRIDL/BC/Stripping/2013-14 20.08.2013

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Client	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of the Work	Asphalting from Pipeline road junction to Abbigere village Abbigere main road in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
Reference	EE/DD/WO/122/2011-12 Dated: 10.02.2012
Type of Mix	Bituminous Concrete
Date of Testing	20.08.2013

Type of binder : 60/70

Percentage of binder used : 5.00% by wt.

Total weight of aggregate : 200 g

Total weight of binder : 10.00 g

Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	3.1	3.20	96.80
2	3.2		
3	3.3		

Comments:

→ Minimum allowable Aggregate retained coating for Bituminous Concrete is 95%

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Job No.: CTCE/BBMP/W.No.12/KRIDL/BC/Sp_Wa/2013-14 20.08.2013

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Client	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of the Work	Asphalting from Pipeline road junction to Abbigere village Abbigere main road in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
Reference	EE/DD/WO/122/2011-12 Dated: 10.02.2012
Type of Mix	Bituminous Concrete
Date of Testing	20.08.2013

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	1995	1996	1997	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1239	1238	1242	
4	Weight of saturated surface dry aggregate in air	W_3 g	2017	2018	2019	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	778	780	777	
6	Weight of oven dried aggregate	W_4 g	1999	2006	2005	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.569	2.572	2.580	2.574
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.630	2.612	2.628	2.623
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.90%	0.60%	0.70%	0.73%

Comments:

→ Maximum allowable Aggregate Water absorption value for Bituminous Concrete is 2.0%

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JobNo: CTCE/BBMP/W.No.12/KRIDL/BC/Bitumen/2013-14 20.08.2013

BITUMEN CONTENT DETERMINATION OF BITUMINOUS CONCRETE MIX

As per IRC:SP:11-1984

CLIENT	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
AGENCY	**Technical Manager (West),** KRIDL, Bangalore.
NAME OF THE WORK	Asphalting from Pipeline road junction to Abbigere village Abbigere main road in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
REFERENCE	EE/DD/WO/122/2011-12 Dated: 10.02.2012
SAMPLE I/D	Roads in Abbigere village Ward No.12.
DATE OF TESTING	20.08.2013

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	473	474.5
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	27	25.50
7. Bitumen content in %	5.40	5.10
8. Average	**5.25**	

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JobNo: CTCE/BBMP/W.No.12/KRIDL/BC/Bitumen/2013-14 20.08.2013

BITUMEN CONTENT AFTER GRADATION DETERMINATION OF BITUMINOUS CONCRETE MIX

As Per IS 2386 and IRC:SP:11-1984

CLIENT	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
AGENCY	**Technical Manager (West),** KRIDL, Bangalore.
NAME OF THE WORK	Asphalting from Pipeline road junction to Abbigere village Abbigere main road in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
REFERENCE	EE/DD/WO/122/2011-12 Dated: 10.02.2012
SAMPLE I/D	Roads in Abbigere village Ward No.12.
DATE OF TESTING	20.08.2013

GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-18 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	36.32	7.68	7.68	92.32	79-100
9.5	35.21	7.44	15.12	84.88	70-88
4.75	90.22	19.07	34.20	65.80	53-71
2.36	60.22	12.73	46.93	53.07	42-58
1.18	49.32	10.43	57.36	42.64	34-48
0.6	72.23	15.27	72.63	27.37	26-38
0.3	35.26	7.45	80.08	19.92	18-28
0.15	25.65	5.42	85.50	14.50	12-20
0.075	33.26	7.03	92.53	7.47	4-10

Sieve Size in mm	Trail 2				Specified Limits as per MORTH specification table 500-18 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	33.26	7.01	7.01	92.99	79-100
9.5	42.32	8.92	15.93	84.07	70-88
4.75	73.21	15.43	31.36	68.64	53-71
2.36	64.12	13.51	44.87	55.13	42-58
1.18	72.32	15.24	60.11	39.89	34-48
0.6	44.26	9.33	69.44	30.56	26-38
0.3	35.25	7.43	76.87	23.13	18-28
0.15	41.22	8.69	85.56	14.44	12-20
0.075	36.36	7.66	93.22	6.78	4-10

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Job No.: CTCE/BBMP/W.No.12/KRIDL/BC/Agg/2013-14 20.08.2013

Aggregate Gradation Test

IS : 2386 Part I

Client	**Asst. Executive Engineer,** Shettyhalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of theWork	Asphalting from Pipeline road junction to Abbigere village Abbigere main road in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore.
Reference	EE/DD/WO/122/2011-12 Dated: 10.02.2012
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	20.08.2013

Total Weight of Sample: **5200** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	635	12.21	12.21	87.79	79 - 100	
9.5	590	11.35	23.56	76.44	70 - 88	
4.75	625	12.02	35.58	64.42	53 - 71	
2.36	530	10.19	45.77	54.23	42 - 58	
1.18	640	12.31	58.08	41.92	34 - 48	
0.600	560	10.77	68.85	31.15	26 - 38	
0.300	540	10.38	79.23	20.77	18 - 28	
0.150	355	6.83	86.06	13.94	12 - 20	
0.075	355	6.83	92.88	7.12	4 - 10	

Total Weight of Sample: **5300** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	630	11.89	11.89	88.11	79 - 100	
9.5	515	9.72	21.60	78.40	70 - 88	
4.75	620	11.70	33.30	66.70	53 - 71	
2.36	490	9.25	42.55	57.45	42 - 58	
1.18	615	11.60	54.15	45.85	34 - 48	
0.600	620	11.70	65.85	34.15	26 - 38	
0.300	460	8.68	74.53	25.47	18 - 28	
0.150	405	7.64	82.17	17.83	12 - 20	
0.075	520	9.81	91.98	8.02	4 - 10	

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